Terrestrial Mites of New York (Acarina: Prostigmata), I— *Tarsocheylidae*, *Paratydeidae*, and *Pseudocheylidae*

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Abstract: The mites here described were collected from Long Island, Lake Champlain region, and the Mohawk Valley area, New York, in June–October of 1973. The new species described are: Tarsocheylidae, *Hoplocheylus* **similis**, *H.* **americanus**; Paratydeidae, *Scolotydaeus* **simplex**; Pseudocheylidae, *Anoplocheylus* **transiens**. Twenty-six figures are presented. The genus *Neotydeus* Baker is synonymized with *Scolotydaeus* Berlese.

For many years New York has been a favorite collecting ground for various arthropods, and extensive collections have been accumulated in different state institutions (Leonard, 1928). This has not been the case with mites, however, and our knowledge of the mite fauna of this area is almost nonexistent. A survey of terrestrial mites was started in New York in the summer of 1973 by M. D. Delfinado. This collection forms the basis of a proposed series of papers on the mites of New York and neighboring areas.

The present paper deals only with the free-living or primary-feeding and predaceous mites of the families Tarsocheylidae, Paratydeidae and Pseudocheylidae. Members of these families are rather uncommon and only rarely collected. They occur in soil, forest litter and debris, under tree bark and rotten wood, and in moss. One species of Tarsocheylidae, however, was found under the elytra of a passalid beetle in the Congo (Cooreman, 1951). Other Prostigmata collected will be dealt with in later papers.

The mites reported here were collected by the authors and M. Abbatiello from Long Island, the Lake Champlain region and the Mohawk Valley area in June–October 1973, by use of Tullgren-Berlese funnels from forest soil, litter and debris, tree holes and hollow tree trunk debris.

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Family Tarsocheylidae

Genus *Hoplocheylus* Atyeo and Baker, 1964

Hoplocheylus Atyeo and Baker, 1964, Bull. Univ. Nebraska St. Mus. 4: 247. Type-species, *Tarsocheylus atomarius* Berlese, by original designation.

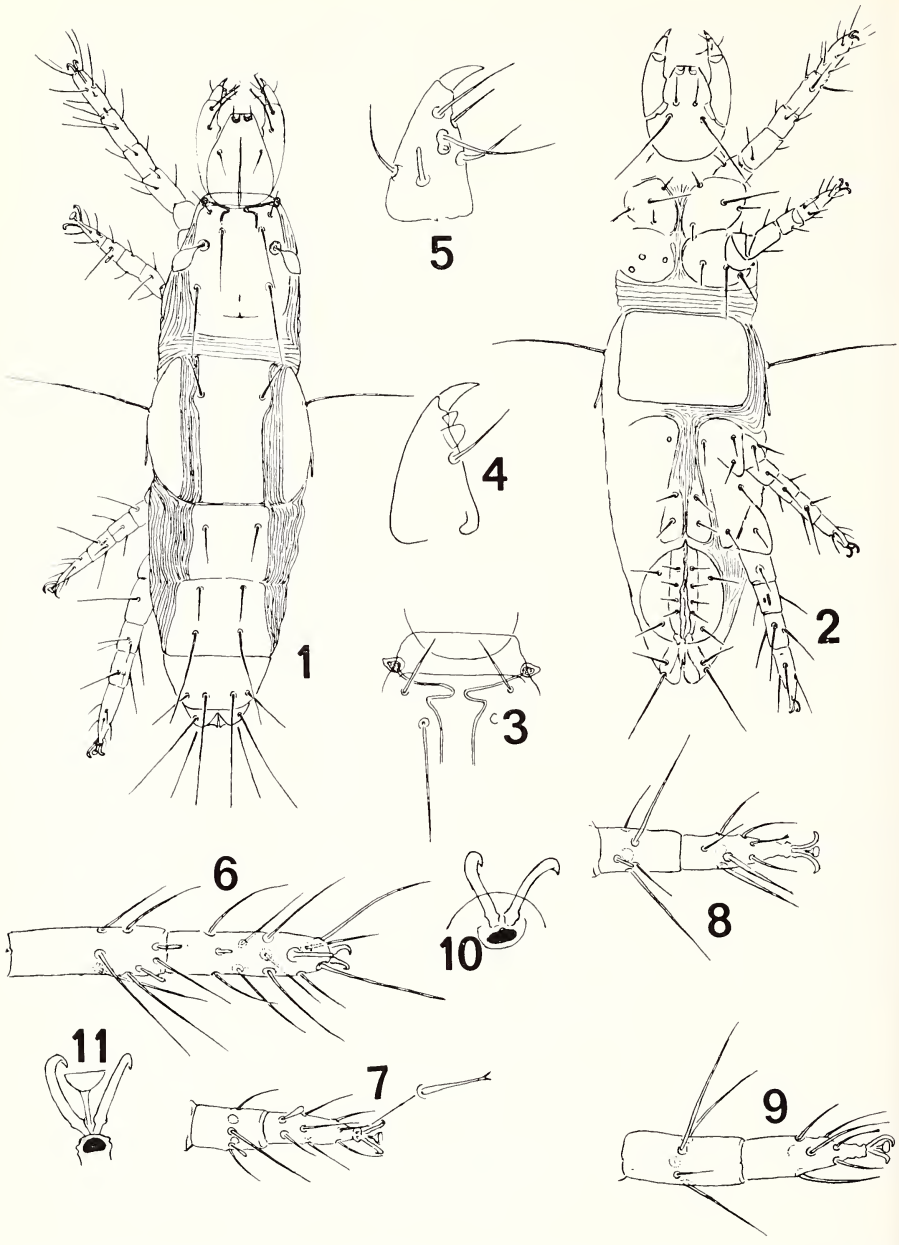
The genus *Hoplocheylus* has the following general characteristics of the family: presence of dorsal hysterosomal plates and a pair of pseudostigmatic organs on propodosomal plate; reduced palpal tarsus and absence of femoral division and pretarsal pedicels on all legs; and presence of simple peritremes with stigmata located on the shoulders of propodosoma as in the Tarsonemini. Atyeo and Baker (1964: 246) in a key to the genera used principally the presence or absence of empodia on legs I (absent in *Hoplocheylus*, present in *Tarsocheylus*) and the structure of palpal tarsus (papilliform in *Tarsocheylus*, indistinguishable or missing in *Hoplocheylus*). Seven species were known in *Hoplocheylus*. Two new species are present in the collection from New York.

Hoplocheylus **similis**, n. sp.
(Figures 1–11)

H. **similis** may be distinguished from the closely related species: *H. discalis* Atyeo and Baker, *H. pickardi* Smiley and Moser and *H.* **americanus**, n. sp. by having the distal solenidion short and not reaching beyond tarsal claws I; by the forked distal setae on tarsi II–IV; by the narrow first medial dorsal plate with sides bulging at the level of the setae, and by the very long posterior dorsal setae on the third hysterosomal plate surpassing the posterior margin of the fourth plate.

Female. Length of body including gnathosoma, 574 microns. Palpus with genu and femur completely fused and with a small inner protuberance; tibiotarsus with 5 simple, long setae, one rodlike solenidion and 2 small unequal subterminal spines as in figures 4 and 5. Chelicerae fused into a single unit and truncate at apex, with 2 pairs of dorsal setae; gnathosoma with two pairs of ventral setae, posterior pair about 3 times as long as anterior pair. Dorsal propodosomal plate bearing a pair of clavate pseudostigmatic organs near lateral margin and 3 pairs of dorsal setae. Peritremes as in figure 3, with stigmata on shoulders of propodosoma, distal ends of tracheae converging medially between propodosomal setae. Hysterosoma (figure 1) dorsally with 4 medial plates and a pair of lateral or humeral plates; first dorsal plate narrow, about twice as long as wide, with sides bulging at level of setae; second plate squarish, about as wide as long, with a pair of short setae; third plate slightly wider than long, with 2 pairs of unequal setae, posterior pair reaching beyond posterior margin of fourth plate; fourth plate with 2 pairs of posterior setae, median pair about 3 times as long as lateral pairs. Dorsal anal region with a pair of terminal setae. Venter as in figure 2, with large rectangular hysterosomal plate, 2 elongate plates between coxae IV each with 2 setae, and 2 large paragenital plates each bearing pair of setae. Leg chaetotaxy as follows; the numbers represent coxa, trochanter, femur, genu, tibia and tarsus:

Leg I. 4 – 1 – 4 – 5 – 6 + 2 – 13 + 2
Leg II. 3 – 1 – 3 – 4 – 5 + 1 – 8 + 1
Leg III. 3 – 2 – 2 – 4 – 5 + 1 – 8
Leg IV. 2 – 1 – 2 – 5 – 5 – 7



Hoplocheylus similis, n. sp. 1, dorsal surface of female; 2, ventral surface of female; 3, peritremes; 4, dorsum of palpal tibia-tarsus; 5, venter of palpal tibia-tarsus; 6, tibia and tarsus I; 7, tibia and tarsus II; 8, tibia and tarsus III; 9, tibia and tarsus IV; 10, claws of leg I; 11, claws and empodium of leg II.

Tarsus I lacks empodium; empodia present on tarsi II–IV; claws present on all legs; solenidion present on tibia I–III, absent on IV; anterior distal seta on tarsi II–IV forked apically; tarsi I and II with 2 and 1 short solenidia respectively; coxae III not entirely separated from coxae IV.

Male. Not known.

Holotype. Female, collected from tree hole debris, Sunken Meadow, North Shore, Long Island, New York, June 26, 1973, by M. D. Delfinado and M. Abbatiello, deposited in the New York State Museum and Science Service, Albany.

Paratypes. Four females, same data as holotype, in the U.S. National Museum and New York State Museum and Science Service collections.

Hoplocheylus **americanus**, n. sp.
(Figures 12–16)

This new species resembles *H. longispinus* Atyeo and Baker and *H. canadensis* Marshall in most respects, and the 3 species are evidently closely related morphologically. The most distinctive characters of *H.* **americanus** are the long solenidia on tarsus and tibia of leg I, and the very small subterminal spines on the palpal tibia and the shape of the ventral hysterosomal plate.

Female. Length of body including gnathosoma, 466 microns. Palpus with genu fused with femur; tibiotarsus with 5 simple setae, one rodlike solenidion and 2 very small, equal in size subterminal spines as in figure 15. Chelicerae fused into a single unit and truncate apically, with 2 pairs of dorsal setae; gnathosoma with 2 pairs of ventral setae, posterior pair only slightly longer than anterior pair. Dorsal propodosomal plate with a pair of pseudostigmatic organs near lateral margin and 3 pairs of dorsal setae. Peritremes situated on shoulders of propodosoma. Hysterosoma (figure 12) with 4 medial dorsal plates and a pair of lateral or humeral plates; first medial dorsal plate longer than wide, with 2 setae; second plate squarish, with 2 setae; third plate large, about as broad as long, with 2 pairs of setae, the posterior pair longer than anterior pair but not reaching posterior margin of fourth plate; fourth plate with 2 pairs of posterior setae nearly equal in length. Dorsal anal region with a pair of terminal setae. Venter as in figure 13; hysterosomal plate large with rounded posterior margin. Leg chaetotaxy as follows; the numbers represent coxa, trochanter, femur, genu, tibia and tarsus:

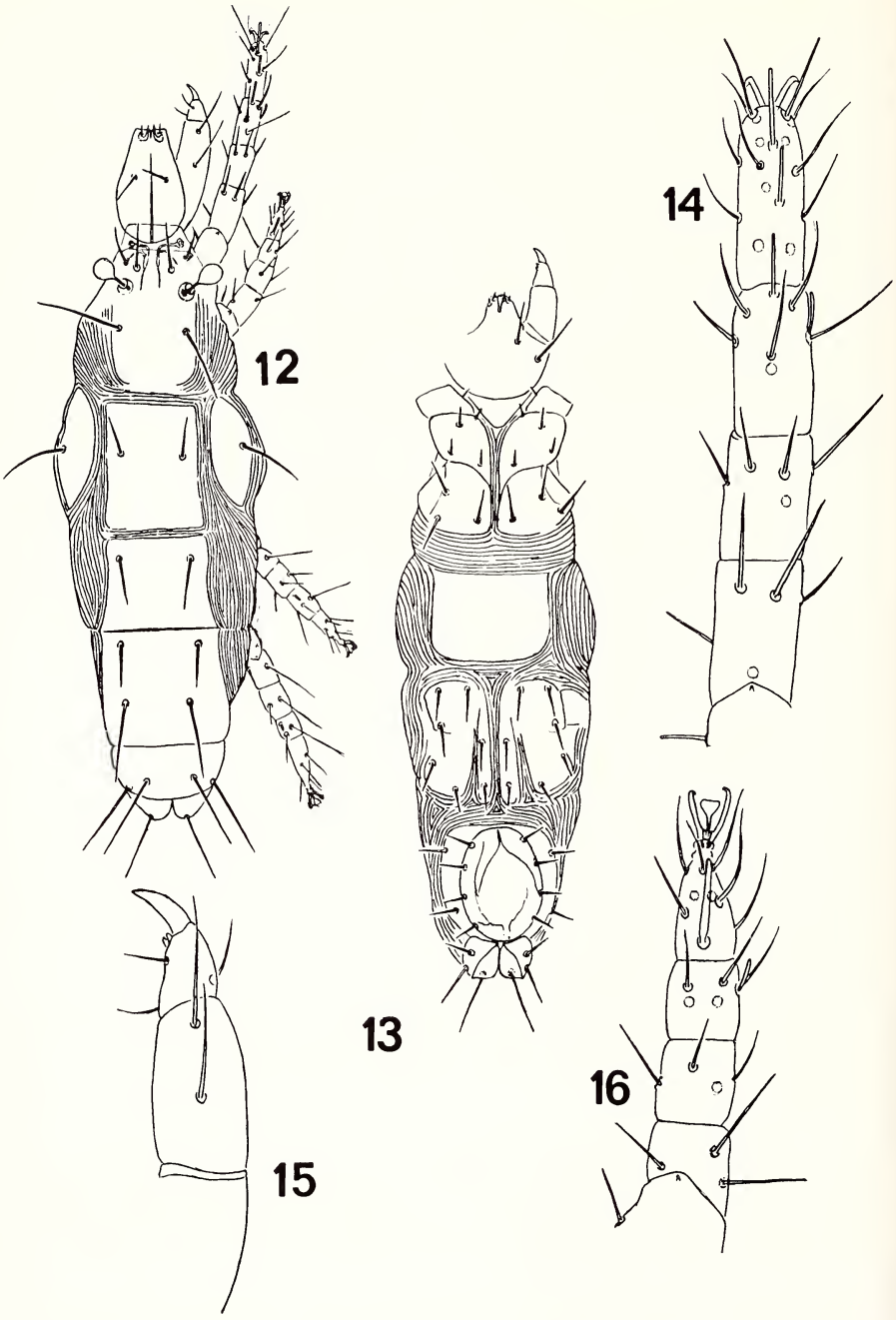
Leg I. 4 – 1 – 5 – 5 – 6 + 2 – 14 + 2
Leg II. 3 – 1 – 3 – 4 – 5 + 1 – 7 + 1
Leg III. 3 – 2 – 2 – 4 – 5 + 1 – 8
Leg IV. 2 – 1 – 2 – 5 – 5 + 1 – 7

Tarsus I lacking empodium; empodia present on tarsi II–IV; claws present on all legs; tibia I–IV each with a solenidion; tarsi I and II with 2 and 1 long solenidia respectively; the distal solenidion on tarsus I very long, reaching apices of claws; coxae III fused with coxae IV.

Male. Not known.

Holotype. Female, collected from soil and pine debris, Lake Champlain region, New York, October 15, 1973, by M. D. Delfinado and E. W. Baker, and deposited in the New York State Museum and Science Service, Albany.

Paratypes. Eight females, same data as holotype, in the U.S. National Museum and New York State Museum and Science Service collections.



Hoplocheylus americanus, n. sp. 12, dorsal surface of female; 13, ventral surface of female; 14, leg I; 15, dorsal view of palpus; 16, dorsal view of leg II.

Family Paratydeidae

Genus *Scolotydaeus* Berlese, 1910

Scolotydaeus Berlese, 1910, Redia 6: 214. Type-species, *Scolotydaeus bacillus* Berlese, by monotypy.

Neotydeus Baker, 1950, Jour. Wash. Acad. Sci. 40 (6): 289. Type-species, *Neotydeus ardisannae* Baker, by original designation. *New synonymy.*

The monotypic genus *Scolotydaeus* was previously known only from a brief description, figure and notes by Berlese (1910), Thor (1933), and Baker (1949) who placed it in the family Tydeidae. Baker (1950) later placed it in the Paratydeidae with *Paratydeus* Baker, 1949, and *Neotydeus* Baker, 1950. *Neotydeus* has proved to be a synonym of *Scolotydaeus*.

The genus *Scolotydaeus* primarily possesses the characters of the family (Baker, 1949, 1950) in that the hysterosoma is divided transversely at the third pair of legs; the palpus is simple; tarsal claws are present on all legs, with small, clawlike empodia, and the proximal venter of femora has a tiny, broadened dark 'seta.' The peritremes are simple, arising from the bases of the chelicerae. The propodosoma lacks the lenselike eyes of *Paratydeus*. The genus now includes 3 species; the one from New York is being described as new.

Scolotydaeus **simplex,** n. sp.
(Figures 17–22)

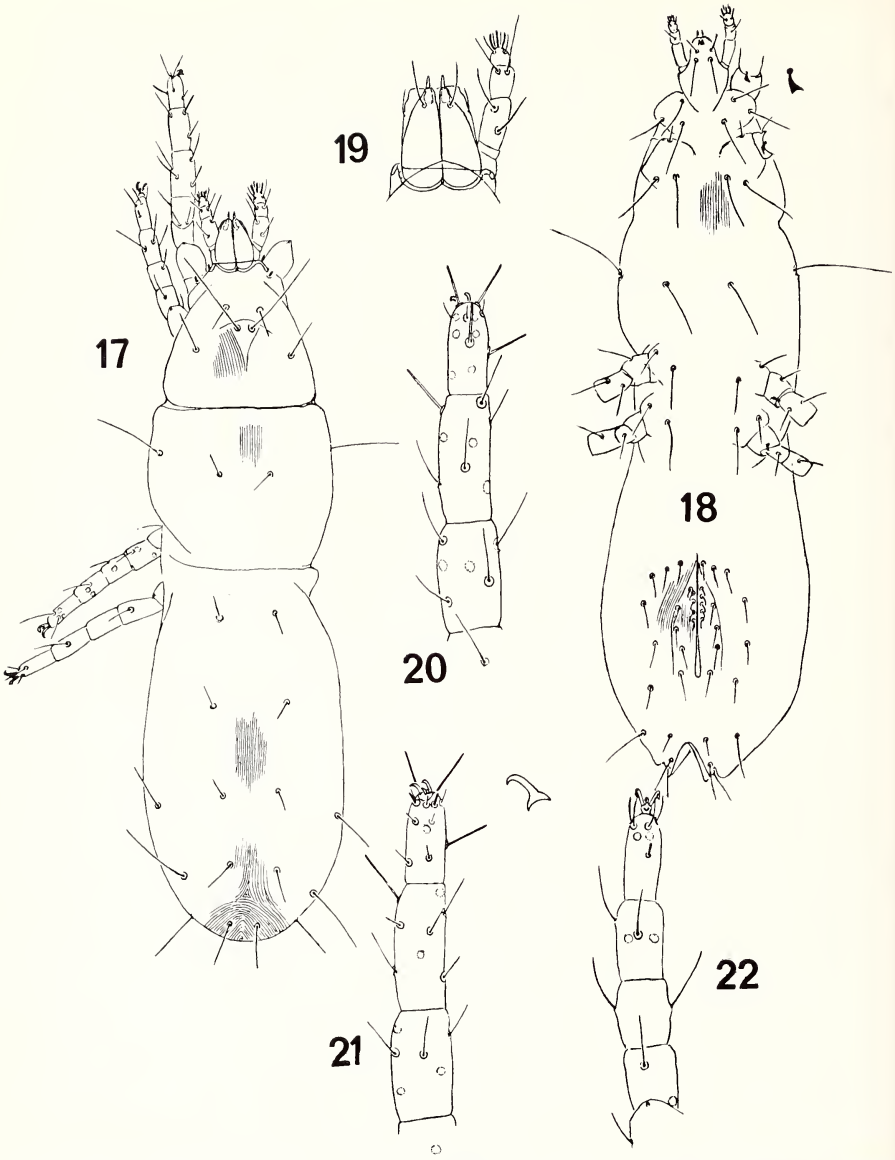
Scolotydaeus **simplex** is similar to *S. ardisanneae* (Baker) in several respects. It is distinguished by its very long solenidia on tarsus and tibia of legs I and much longer posterior (third) propodosomal, humeral and posterior dorsal hysterosomal setae.

Male. Length of body including gnathosoma, 466 microns. Palpus 4-segmented, femur-genu and tibia each with 2 long setae, tarsus with 3 rodlike and 4 short slender setae and one small lateral solenidion. Chelicerae coalesced, suture obvious, movable chela curved and strong, fixed chela not developed (fixed and movable chelae not opposed); gnathosoma with 2 pair of setae, anterior pair shorter. Peritremes simple, short, lightly hooked distally and arising from cheliceral bases. Propodosoma with anterior lateral peglike solenidia; integument striate anteriorly, with 3 pair of slender setae, the anterior median pair long and slender, the posterior pair slightly longer than anterior pair; eyes lacking. Hysterosoma elongate, divided transversely at third pair of legs; humeral setae long, dorsal setae short and slender; areas posterior to third pair of legs with first 2 pairs of setae in longitudinal row; posterior setae in transverse rows, posterior lateral setae shorter. Venter as in figure 18, ventral hysterosomal setae longer than setae at genital region with 4 pairs of genital and 6 pairs of paragenital setae, transverse row of posterior ventral setae and 2 pairs of anal setae. Internally, genitalia with 5 pairs of short setae, and 4–5 pairs of short spines on internal "spermatophore" apparatus (not figured). Leg chaetotaxy as follows; the numbers represent coxa, trochanter, femur, genu, tibia and tarsus:

Leg I. 4 – 0 – 3 + 5 (*) – 6 – 8 (7 + 1) – 12 + 1
Leg II. 3 – 1 – 2 – 2 – 4 – 7
Leg III. 2 – 1 – 3 – 2 – 3 – 5
Leg IV. 2 – 0 – 3 + 1 (*) – 1 – 3 – 5

Claws large, uncinate; empodia of all legs small and uncinate; femora I and IV divided into basi- and telofemur with setal count as above (*). All solenidia on tarsus and tibia of legs I very long and nearly equal in length.

Female. Similar to male, except genitalia much longer. Length same.



Scolotydaeus simplex, n. sp. 17, dorsal surface of male; 18, ventral surface of male; 19, details of gnathosoma; 20, dorsal view of leg I; 21, ventral view of leg I with detail of tarsal claw; 22, dorsal view of tibia II.

Holotype. Male, collected from pine debris, bark and roots, Hague, Lake George, Adirondack Park, New York, October 11, 1973, by M. D. Delfinado and E. W. Baker, deposited in the New York State Museum and Science Service, Albany, N.Y.

Paratypes. Two females, with the above data, in the U.S. National Museum and New York State Museum and Science Service collections.

Family Pseudocheylidae

Genus *Anoplocheylus* Berlese, 1910

Pseudocheylus, subg. *Anoplocheylus* Berlese, 1910, Redia 6: 210. Type-species, *Pseudocheylus* (*Anoplocheylus*) *europaeus* Berlese, by original designation.

Rhagina Womersley, 1935, Rec. So. Australian Mus. 5 (3): 336. Type-species, *Rhagina protea* Womersley, by original designation.

This genus is characterized by the absence of claws on all legs which terminate with a stalked membranous empodia. The peritremes are simple, chambered and located in the membrane connecting the gnathosoma and propodosoma; the palpal tarsus complex is lacking; the chelicerae are attached basally and are movable laterally; a pair of lenslike eyes is located on the anterior outer margins of the propodosomal plate. Five species were previously known in the genus *Anoplocheylus*. The new species here described from New York is the first records of the genus in North America.

Anoplocheylus **transiens**, n. sp.
(Figures 23–26)

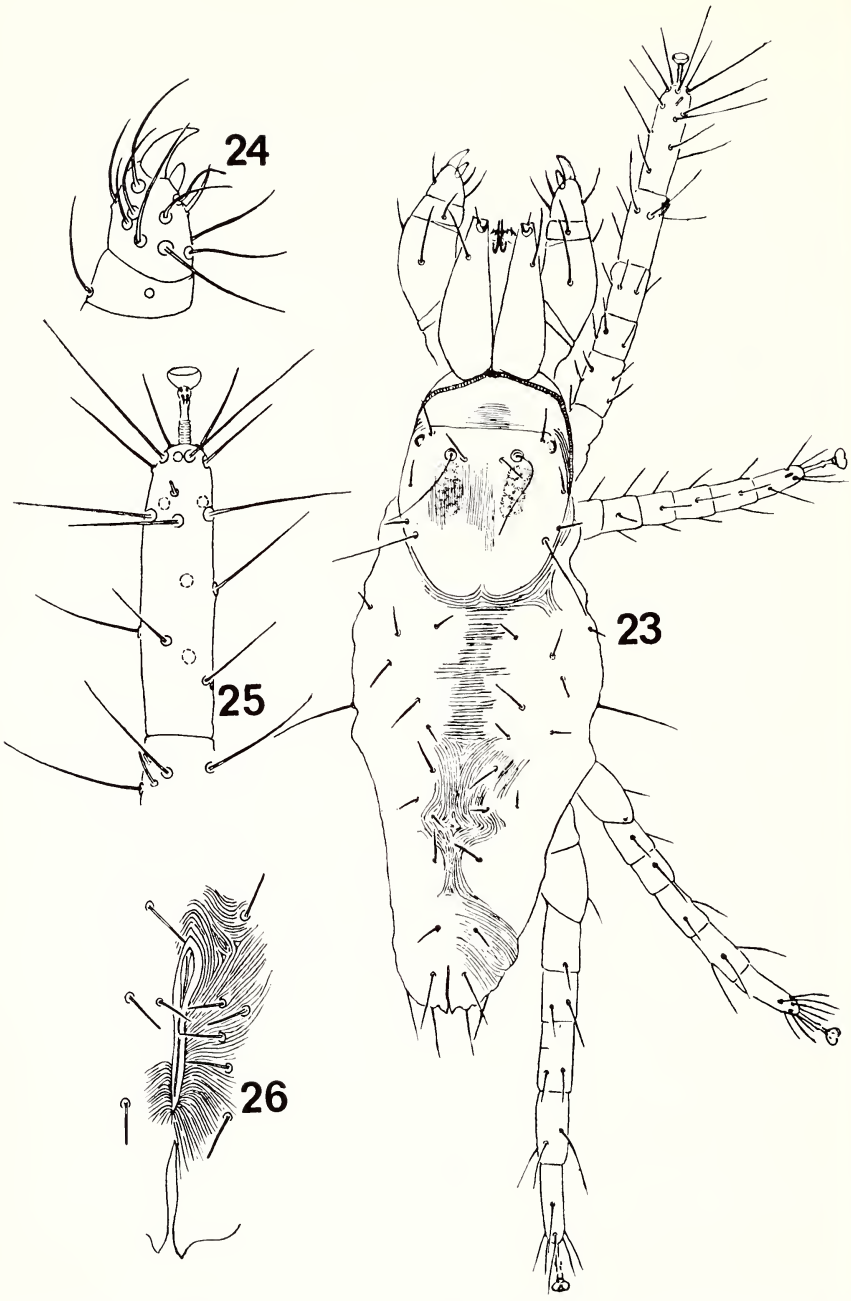
Anoplocheylus **transiens** is similar to *A. aegypticus* Baker and Atyeo and *A. tauricus* Livshitz and Mitrofanov in having the subcuticular reticulate bands on the propodosoma. It differs in having all dorsal hysterosomal setae of approximately equal length. We have examined adult and immature specimens of *aegypticus* and confirmed the presence of 3 coxal setae as figured. The text (Baker and Atyeo, 1964: 268) is in error stating that coxa II has 4 setae.

Female (?). Length of body including gnathosoma, 530 microns. Palpus without thumb-claw complex, with 4 distinct segments and a terminal claw. Peritremes chambered throughout, arising at bases of chelicerae and situated on membrane separating gnathosoma from propodosoma. Chelicerae hinged at bases and capable of lateral movement. Propodosomal plate with fine, longitudinal striae; a single pair of lenslike eyes; 4 pairs of short setae, the median pair located between anterior trichobothria; the posterior marginal pair quite long and slender; subcuticular reticulate bands on propodosoma posterior to trichobothria. Hysterosoma with transverse striae anteriorly and posteriorly, longitudinal in region of coxae III and IV; humeral setae long, slender; dorsal body setae all short except for posterior setae of varying lengths. Genitalia longitudinal, usually with 4 pairs of short genital setae and 3 pairs of paragenital plates. Sternal area with 2, 3 or 4 short setae. All legs ending in stalked membranous empodia, claws lacking. Leg chaetotaxy as follows, the numbers refer to coxa, trochanter, basifemur, telofemur, genu, tibia and tarsus:

Leg I. 5 – 1 – 8 – 6 – 7 – 8 + 1 – 19 + 4
Leg II. 3 – 1 – 2 – 4 – 5 – 5 – 9 + 1
Leg III. 3 – 2 – 2 – 3 – 4 – 5 – 9
Leg IV. 2 – 1 – 1 – 2 – 4 – 6 – 9

Male. Not known.

Holotype. Female (?), collected from leaf litter, Rensselaerville, New York, October, 1973 (no exact date), by M. D. Delfinado, deposited in the New York State Museum and Science Service, Albany.



Pseudocheylus transiens, n. sp. 23, dorsal surface of female; 24, distal portion of venter of palpus; 25, palpus I and distal portion of tibia I; 26, genitalia.

Paratypes. Seven females (?), 4 with the above data; 1 from litter, Taconic Parkway, New York, June 16, 1973; 1 from litter, Heckscher Park, Long Island, New York, June 14, 1973; and 1 from debris, Rt. 87, 36 miles from New York City, July 22, 1973, all collected by M. D. Delfinado, deposited in the U.S. National Museum and New York State Museum and Science Service collections.

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Centennial of Entomology at Cornell

The faculty of the Department of Entomology at Cornell University will celebrate 100 years of entomology at Cornell on October 14 and 15 with a special symposium. John Henry Comstock graduated from Cornell in 1874 and we take this opportunity to honor the man who founded our department.

The symposium will bring many invited guests to the University and affords an opportunity for persons to discuss the dynamic aspects of entomology. The complete program will be carried in the September issue of the *Bulletin* of the Entomological Society of America.